AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-18 (Cancelled)

19. (Currently amended) A system for measuring the spatial dimensions of a three-dimensional object positioned on an object plane, comprising:

~~a lens having a high degree of chromatic aberration and~~ a light source for emitting wavelengths of light, said light source being positioned so as to direct said wavelengths of light at said object without any intermediate structures therebetween and so as to direct said wavelengths of light over an area of said object;

a lens positioned to receive reflections of said wavelengths of light from said object, wherein said lens has a high degree of chromatic aberration;

an optical axis normal to said object plane and passing through a focal point of said lens;

a sensor ~~defining an optical axis normal to an object plane of said object and passing through a focal point of said lens;~~said sensor having ~~at least a first photodetector and a second photodetector~~a plurality of photodetectors, each of said plurality of photodetectors having electrical outputs, said sensor being positioned to receive said reflections of said wavelengths of light after said reflections pass through said lens, said sensor in optical alignment with said object along said optical axis; ~~optically aligned with said object through said lens and by~~

a diffraction grating disposed between said lens and said sensor for directing each of said wavelengths of light, ~~whereby said diffraction grating separates the spectrum of light reaching said sensor such that different wavelengths of light collected from said object by said lens are then directed~~ to a different one of said plurality of photodetectors ~~on said sensor and furthermore because of the high degree of longitudinal chromic aberration of the lens, different wavelengths of light come to best focus in the object plane at different distances from said lens,~~ said diffraction grating in optical alignment with said sensor along said optical axis;

a processor for receiving said electrical outputs from each of said plurality of photodetectors, said processor determining being provided to a processor that determines a distance of said object from said lens and thereby a height of said object.

20. (Previously presented) The system of claim 19 wherein said lens has numerical aperture of at least about 0.1 to achieve a shallow depth of focus.

21. (Previously presented) The system of claim 19 wherein said lens is telecentric.

22. (Previously presented) The system of claim 19 wherein said object is capable of motion relative to said sensor.

23. (Previously presented) The system of claim 22 wherein said motion is orthogonal to said optical axis.

24. (Previously presented) The system of claim 22 wherein said motion periodically triggers data acquisition of the sensor to build up a three dimensional representation of the object.

25. (Cancelled)

26. (Currently Amended) The system of claim [25] 19 wherein said multitude plurality of photodetectors forms a regular rectangular array.

27. (Currently Amended) The system of claim [25] 19 wherein said processor acts as a buffer to an electronic computer, said electronic computer managing one or more of motion control, sensor image acquisition, triggering and image analysis.

28. (Previously presented) The system of claim 27 wherein said electronic processing buffer converts said electronic signal from said sensor to a gray-scale value that is subsequently converted to a height measurement.

29. (Currently Amended) The system of claim 27 wherein said buffer includes an algorithm to determine z-axis height position of points on the object with respect to said nominal object plane by means of contrast comparison of said plurality of photodetectors.

Claim 29 (Cancelled)

31. (Previously presented) The computer system as described in claim 27 that compares the three-dimensional representation of said object for conformance of said object to a stored quality standard.